CALIFORNIA DIVISION OF MINES AND GEOLOGY

FAULT EVALUATION REPORT FER-120

SUPPLEMENT NO. 1

October 29, 1981

1. Name of fault.

San Andreas fault, northern San Mateo County area.

2. Location of fault.

Montara Mountain 7.5-minute quadrangle.

3. Reason for supplemental evaluation.

Additional information was received subsequent to release of the Preliminary Review Map of the Montara Mountain quadrangle.

4. Additional references.

California Division of Mines and Geology, 1981, Preliminary review map of Special Studies Zones, Montara Mountain quadrangle.

Hall, N.T., 1981, Unpublished map of the San Andreas fault between San Andreas Lake and Lower Crystal Springs Reservoir, scale 1:4800.

Pampeyan, E.H., 1981a, Geologic map of the Montara Mountain quadrangle, San Mateo County, California: U.S. Geological Survey Open-File Report 81-451, scale 1:12,000.

_____, 1981b, Letter to E.W. Hart regarding the information portrayed on the Preliminary Review Map of July 1, 1981, of the Montara Mountain quadrangle.

5. Summary of additional information.

After the release of the Preliminary Review Maps by the California Division of Mines and Geology on 7/1/81, a geologic map of the Montara Mountain quadrangle was released by the U.S.G.S. (Pampeyan, 1981a). The location of the San Andreas fault shown by Pampeyan differs substantially from that shown on the preliminary review map in three places (see Fig. 1). At the northern end of San Andreas Lake,

Pampeyan depicts the active fault slightly to the west of that depicted by CDMG. Between San Andreas Lake and Lower Crystal Springs Reservoir, Pampeyan also depicts the fault slightly west of that shown by CDMG. He also cites the location of a pipeline ruptured by fault movement in 1906 near the eastern margin of the quadrangle (the third location).

Near the northern margin of the quadrangle, Pampeyan (1981a) shows two branch faults and two air photo lineaments, which he cites in his letter (1981b) as relatively young (see Fig. 1). He reports that the easternmost of these faults (Fault A) cuts Merced Formation and that a sag pond was visible along the fault on 1946 air photos. He shows the second fault (Fault B) as entirely in Franciscan material. He reports that two possbile sag ponds were visible adjacent to the lineaments on the 1946 air photos.

Hall has forwarded a copy of a detailed, annotated map of the San Andreas fault between San Andreas Lake and Lower Crystal Springs Reservoir (Hall, 1981). According to Hall, the San Andreas fault has been identified in trenches at several locations (see Fig. 1). He also has verified locations of the 1906 rupture. Hall (1981) and Pampeyan (1981) generally agree on the location of the most recently active faults, differing slightly in detail. Both Hall and Pampeyan commented that several of the features depicted on Figure 3B in FER-120 between the lake and the reservoir follow a pipeline and are artificial.

6. Air photo interpretation.

USDA (1941) photos # 29-31 were re-examined for this supplemental report. The sag pond reported by Pampeyan (1981a; 1981b) along fault A (Fig. 1) was indeed present. Several other sag ponds were also present a few thousand feet to the north in the San Francisco South quadrangle. The latter ponds are fairly clearly due to

landsliding or lateral spreading. The pond along fault A was observed during the preparation of FER-120, and was also interpreted to be the result of lateral spreading of the ridge top. Vague tonals were observed along faults A and B. The stream north of fault B appears broadly deflected. It is possible that this deflection may have been "inherited" from the main trace which lies along about 350 feet to the west.

The 1941 photos were scanned for evidence of the sag ponds reported by Pampeyan (1981a; 1981b) along the photo lineaments north of San Andreas Lake. A slight depression (dry in March 1941) may have been present in the location of his northern-most pond. However, this possible depression could have been produced by the damming of the poorly defined drainage by a fan (to the south) and landslide debris (to the north). The southern depression was not detected on the 1941 photos although a patch of slightly darker vegetation is present along the margin of a fan. Several tonal lineaments are present in the alluvium. Some appear to be fences or pipelines; some probably reflect differences in the alluvial deposits (channel deposits, for example). However, none are clearly the result of fairly recent Holocene faulting.

The fault trace mapped by Pampeyan beneath San Andreas Lake could not be observed since the lake was at its highest level in 1941. The photos do clearly show two small linear sag ponds along the trace delineated on the preliminary review map (see Fig. 3B in FER-120).

In the area between San Andreas Lake and Lower Crystal Springs Reservoir, the faults mapped by Pampeyan (1981a) and Hall (1981) are largely obscured by trees and brush.

7. Conclusions.

Based on the detailed mapping by Hall (1981) and Pampeyan (1981a), it appears that several of the features shown on Fig. 3B of FER-120 between Lower Crystal Springs Reservoir and San Andreas Lake are artificial. Also, the main recent fault break appears to be west of that shown on the preliminary review map in the area between these two lakes. To the south, the reported pipeline offset suggests the 1906 break lies slightly west of that shown on the preliminary review map. Also, based on Pampeyan's (1975; 1981) maps, it appears there is an additional Holocene fault beneath part of San Andreas Lake south of John Muir School.

It appears that recent movement has occurred along fault A, although it is not certain whether this movement is the result of tectonic stresses or gravity. Equivocal evidence exists to support recent movement along fault B.

The air photo lineaments and associated sag ponds noted by Pampeyan (1981) could not be clearly vertified. Pampeyan's use of an air photo lineament symbol instead of a fault symbol for these features indicates he too has doubts about the cause of the features he observed.

8. Recommendations.

As a result of this re-evaluation, the following changes to the SSZ map appear appropriate (see Fig. 2):

1. Add a fault beneath Lower Crystal Springs Reservoir as shown on Fig. 2.
2. In the area between the reservoir and the lake, show the faults mapped by Hall (1981) and delete those shown on the preliminary map.

3. Add the fault shown by Pampeyan (1981) beneath San Andreas Lake.

4. Add faults A and B to the map, modifying the Special Studies Zone slightly.

5. Do not show the air photo lineaments of Pampeyan.

9. Investigating geologist; date.

Theodore C. Smith

THEODORE C. SMITH
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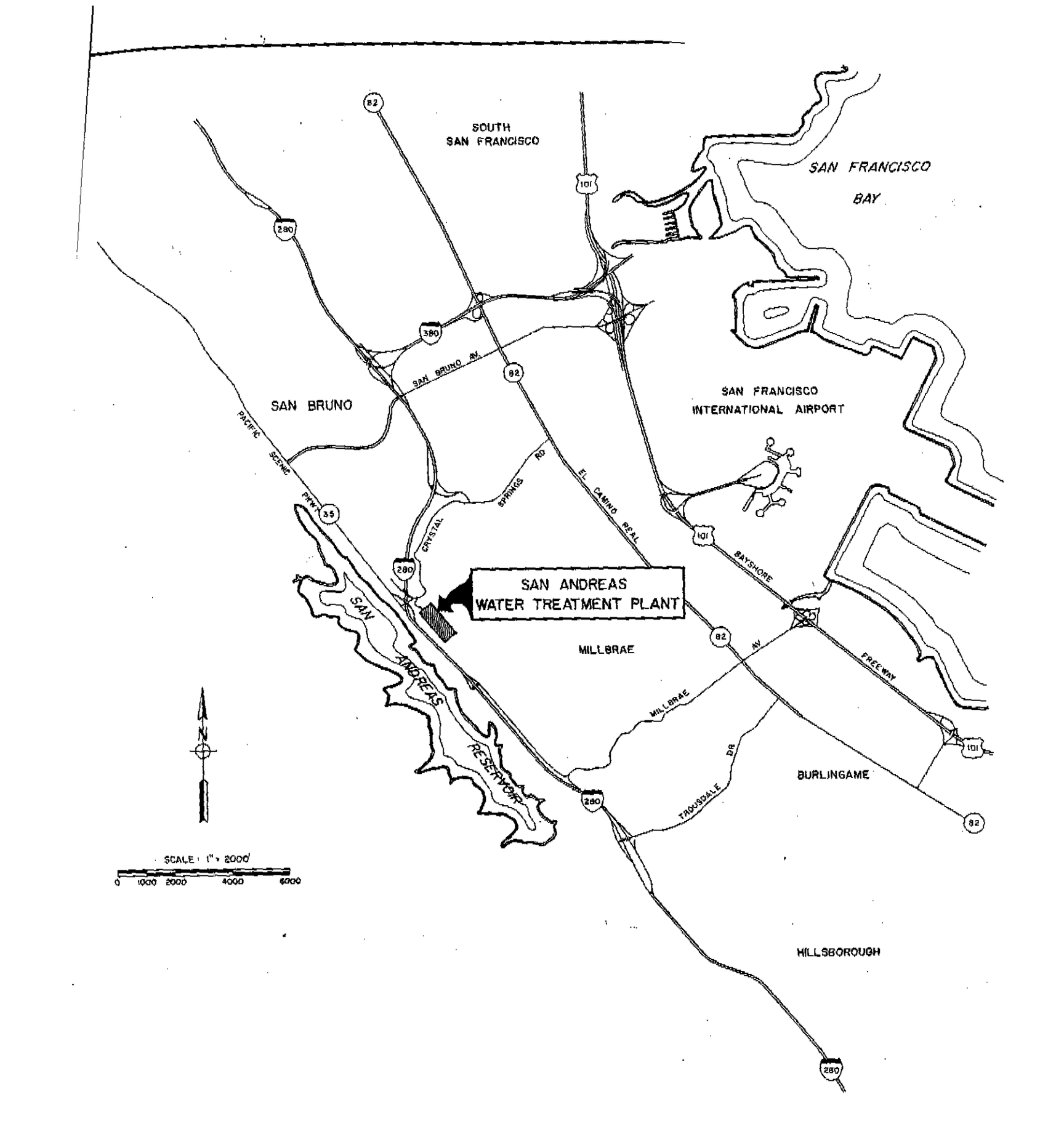
RG 3445, CEG 1029
October 29, 1981

TCS/map

I agree with the recommendations.
10/30/81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BURLINGAME
HILLSBOROUGH
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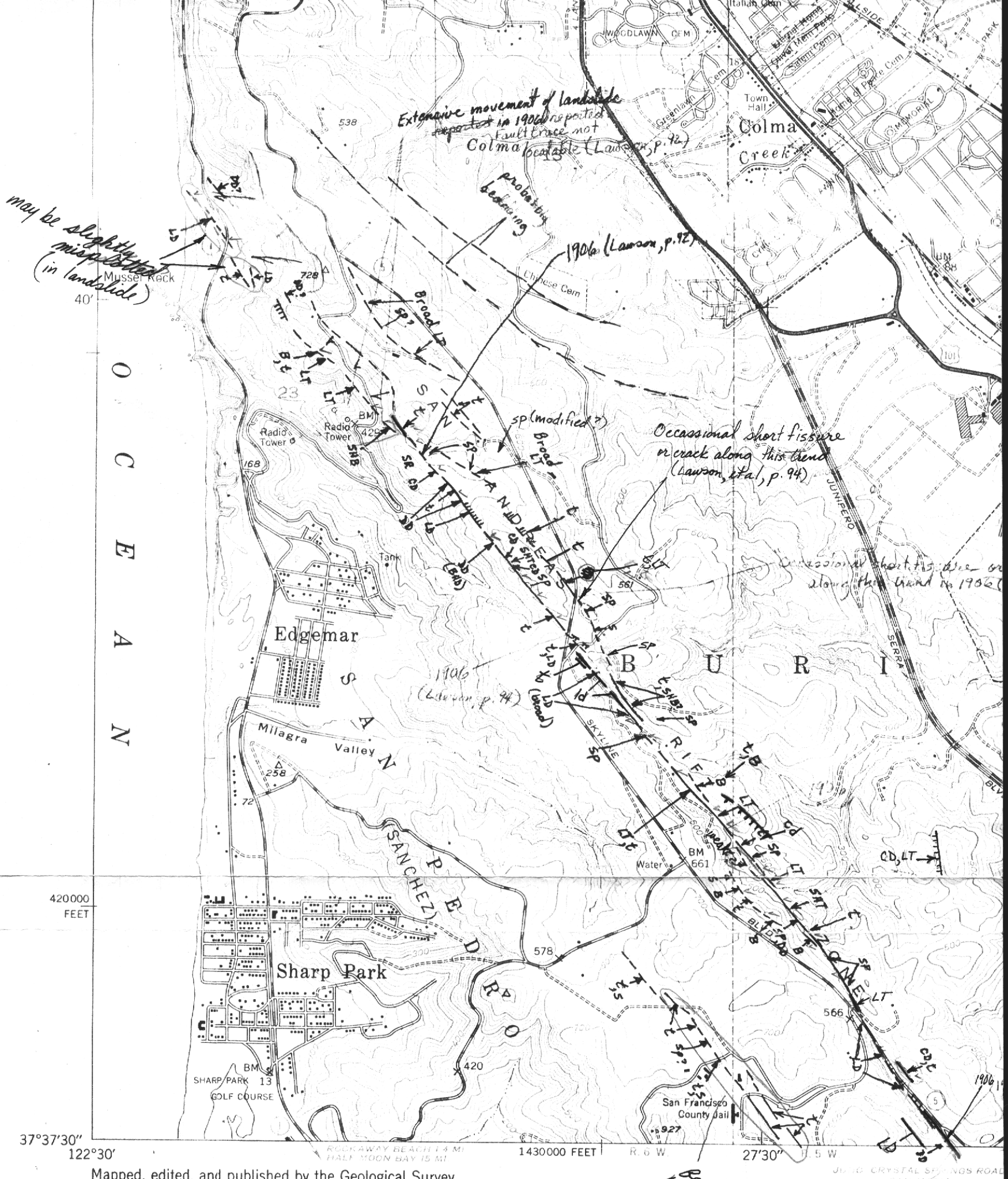

Mapped, edited, and published by the Geological Survey

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Topography from aerial photographs by multiplex methods
Aerial photographs taken 1946. Field check 1947

Polyconic projection. 1927 North American datum
10,000-foot grid based on California coordinate system, zone 3

Red tint indicates area in which only landmark buildings are shown

Dashed land lines indicate approximate location

SHORELINE SHOWN
THE AVE

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Figure 3A. Air photo interpretation, with annotations from Lawson, and others (1908).

DD = right-laterally deflected drainage
SHB = side-hill bench
t = tonal
LD = linear drainage
CD = closed depression
LT = linear trough
SHT = side-hill trough
SP = sag pond
B = bench
S = saddle
SR = shutter ridge
MT = main trace (Hart notation)

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Figure 4B. Recommended Special Studies Zones.

SCALE 1